

IN THE CLAIMS:

Please cancel Claims 2-6, 12, 22-26, and 32 without prejudice to or disclaimer of the subject matter recited therein.

Please amend Claims 1, 10, 21, 30, 41, and 42 as follows.

1. (Currently Amended) An image processing apparatus which embeds ~~predetermined information in an image and outputs the image to a printer which outputs the image as a print;~~ additional information in an image, the apparatus comprising:

input means for ~~entering~~ inputting the image; and

~~division means for dividing the entered image into plural image areas;~~

~~————— pseudo gradation process means for quantizing the image areas divided by said division means, utilizing error diffusion method; and~~

~~————— control means for controlling, in a unit of the image area, a quantization condition by said pseudo gradation process means according to the predetermined information, and for causing in a unit of the image area, to generate a pattern in which a dot arrangement is different according to the predetermined information on the image output as the print~~

quantization means for quantizing the image input by said input means, utilizing an error diffusion method,

wherein said quantization means embeds the additional information by using a threshold different from a threshold used when not embedding additional information in a partial area in the inputted image, and

said quantization means periodically arranges the area which use the threshold different from the threshold used when not embedding the additional information, and

said quantization means embeds the additional information by changing a combination of the horizontal period and the vertical period used when arranging the areas.

2. - 6. (Cancelled)

7. (Original) An image processing apparatus according to Claim 1, wherein said predetermined information is audio information.

8. (Previously Presented) An image processing apparatus according to Claim 1, wherein said predetermined information is information relating to a copyright of the image.

9. (Previously Presented) An image processing apparatus according to Claim 1, wherein said predetermined information is added to the image in such a manner not easily visible to a human eye.

10. (Currently Amended) An image processing apparatus ~~according to Claim 1,~~
~~wherein said apparatus~~ which extracts the predetermined additional information from the an
image in which the ~~predetermined~~ additional information has been embedded, the apparatus
further comprising:

input means for ~~entering~~ inputting the image ~~by scanning the print;~~

transformation means for executing frequency transformation on the image ~~areas~~
~~divided by said division means;~~

classification means for classifying the image areas into plural classes based on the transformation process of said transformation means; and

~~extraction means for extracting the predetermined information, based on a feature amount of each class thus classified~~

calculation means for calculating a feature amount of each class based on a conversion coefficient of the classified class;

comparison means for relatively comparing sizes of the feature amounts of the calculated classes; and

extracting means for extracting the additional information based on a comparison result.

11. (Original) An image processing apparatus according to Claim 10, wherein said frequency transformation is an orthogonal transformation.

12. (Cancelled)

13. (Original) An image processing apparatus according to Claim 10, further comprising:

evaluation means for evaluating a result of evaluation; and

re-division means for executing again the division process of said division means, based on the result of evaluation by said evaluation means.

14. (Original) An image processing apparatus according to Claim 13, wherein said re-division means executes division again by changing the dividing position of the division.

15. (Original) An image processing apparatus according to Claim 13, wherein said re-division means executes division again by changing a size of division.

16. (Previously Presented) An image processing apparatus according to Claim 10, wherein said feature amount is an absolute value of coefficients of transformation by said transformation means.

17. (Original) An image processing apparatus according to Claim 10, wherein said feature amount is electric power.

18. (Original) An image processing apparatus according to Claim 10, wherein said predetermined information is audio information.

19. (Original) An image processing apparatus according to Claim 10, wherein said predetermined information is information relating to copyright of the image.

20. (Original) An image processing apparatus according to Claim 10, wherein said predetermined information is added to the image in such a manner not easily visible to human eyes.

21. (Currently Amended) An image processing method capable of embedding predetermined information in an image and outputting the image to a printer which outputs the image as a print additional information in an image, the method comprising:

an input step of ~~entering~~ inputting the image; and

~~a division step of dividing the entered image into plural image areas;~~

~~————— a pseudo gradation process step of quantizing the image areas divided by said division means, utilizing error diffusion method; and~~

~~————— a control step of controlling, in a unit of the image area, a quantization condition by said pseudo gradation process step according to the predetermined information, and for causing, in a unit of the area, to generate a pattern in which a dot arrangement is different according to the predetermined information on the image output as the print~~

a quantization step of quantizing the image input in said input step, utilizing an error diffusion method,

wherein said quantization step embeds the additional information by using a threshold different from a threshold used in case when not embedding the additional information in a partial area in the inputted image, and

said quantization step periodically arranges the areas to which use the threshold different from the threshold used when not embedding the additional information, and

said quantization step embeds the additional information by changing a combination of the horizontal period and the vertical period used when arranging the areas.

22. - 26. (Cancelled)

27. (Original) An image processing method according to Claim 21, wherein said predetermined information is audio information.

28. (Previously Presented) An image processing method according to Claim 21, wherein said predetermined information is information relating to a copyright of the image.

29. (Original) An image processing method according to Claim 21, wherein said predetermined information is added to the image in such a manner not easily visible to human eyes.

30. (Currently Amended) An image processing method ~~according to Claim 21,~~ wherein the method which is capable of extracting the predetermined additional information from the an image in which the predetermined additional information has been embedded, the method further comprising:

an input step of ~~entering~~ inputting the image ~~by scanning the print;~~

a division step of dividing the entered image into plural image areas;

a transformation step of executing frequency transformation on the image ~~areas~~ divided by said division step;

a classification step of classifying the image ~~areas~~ into plural classes based on the transformation process of said information step; ~~and~~

~~an extraction step of extracting the predetermined information, based on a feature amount of each class thus classified~~

a calculation step of calculating a feature amount of each class based on a conversion coefficient of the classified class;
a comparison step of relatively comparing sizes of the feature amounts of the calculated classes, and
an extraction step of extracting the additional information based on a comparison result.

31. (Original) An image processing method according to claim 30, wherein said frequency transformation is an orthogonal transformation.

32. (Cancelled)

33. (Original) An image processing method according to claim 30, further comprising:

an evaluation step of evaluating a result of evaluation; and

a re-division means for executing again the division process of said division step, based on the result of evaluation by said evaluation step.

34. (Original) An image processing method according to claim 33, wherein said re-division step executes division again by changing the dividing position of the division.

35. (Original) An image processing method according to claim 33, wherein said re-division step executes division again by changing the size of division.

36. (Previously Presented) An image processing method according to claim 30, wherein said feature amount is an absolute value of the coefficients of transformation by said transformation step.

37. (Original) An image processing method according to claim 30, wherein said feature amount is electric power.

38. (Original) An image processing method according to claim 30, wherein said predetermined information is audio information.

39. (Original) An image processing method according to claim 30, wherein said predetermined information is information relating to copyright of the image.

40. (Original) An image processing method according to claim 30, wherein said predetermined information is added to the image in such a manner not easily visible to human eyes.

41. (Currently Amended) A computer readable memory medium which stores program codes for embedding ~~predetermined information in an image and for outputting the image to a printer which outputs the image as a print,~~ additional information in an image, the program codes comprising:

a code for ~~entering~~ inputting the image; and

~~a code for dividing the entered image into plural image areas;~~

~~_____ a code for a pseudo gradation process of quantizing the image areas divided by said dividing, utilizing error diffusion method; and~~

~~_____ a code for controlling, in the unit of the image area, a quantization condition by said pseudo gradation process according to the predetermined information, and for causing in a unit of the image area, to generate a pattern in which a dot arrangement is different according to the predetermined information on the image output as the print~~

a code for quantizing the image input by said input step, utilizing an error diffusion method,

wherein said quantizing step embeds the additional information by using a threshold different from a threshold used when not embedding the additional information in a partial area in the inputted image, and

said quantizing step periodically arranges the areas which use the threshold different from the threshold used when embedding the additional information, and

said quantizing step embeds the additional information by changing a combination of the horizontal period and the vertical period used when arranging the areas.

42. (Currently Amended) A computer readable memory medium ~~according to Claim 41, wherein said medium~~ which stores program codes for extracting ~~the predetermined~~ additional information from an image in which ~~the predetermined~~ additional information has been embedded, the program codes further comprising:

a code for ~~entering~~ inputting said image ~~by scanning the print;~~

a code for executing frequency transformation on the image ~~areas divided by said division means;~~

a code for classifying said image ~~areas~~ into plural classes based on the transformation process of said transformation means; ~~and~~
~~———— a code for extracting said predetermined information, based on a feature amount of each class thus classified~~

a code for calculating a feature amount of each class based on a conversion coefficient of the classified class;

a code for relatively comparing sizes of the feature amounts of the calculated classes; and

a code for extracting the additional information based on a comparison result.

43. (Withdrawn) An image processing apparatus which adds predetermined information to an image, comprising:

input means for entering the image;

division means for dividing the entered image into plural image areas;

quantization means for quantizing the image areas divided by said division means, utilizing an error diffusion method; and

power generation means for generating power of a predetermined frequency component in unit of the image area according to the predetermined information,

wherein the predetermined frequency component is a frequency component lower than a maximum frequency component generated by said quantization means.

44. (Withdrawn) An image processing method for adding predetermined information to an image, comprising:

an input step of entering the image;

a division step of dividing the entered image into plural image areas;

a quantization step of quantizing the image areas divided in said division step, utilizing an error diffusion method; and

a power generation step for generating power of a predetermined frequency component in unit of the image area according to the predetermined information,

wherein the predetermined frequency component is a frequency component lower than a maximum frequency component generated in said quantization step.